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L12: Entry 7 of 7 File: USPT Jun 11, 2002

DOCUMENT-IDENTIFIER: US 6405123 B1
TITLE: Method and system for an efficient operating environment in a real-time navigation system

Detailed Description Text (2):
FIG. 1 shows an architecture for an interactive real-time distributed navigation system in accordance with a preferred embodiment. The various components and their interaction will now be described. It is to be understood that where like numerals are used in different figures, such like numerals refer to the same item. Wireless device 202 may take the form of a cellular telephone, satellite telephone, wireless Personal Digital Assistant (PDA), personal computer or other suitable device having wireless communications capability. Preferably, wireless device 202 is equipped with positioning capability that takes the form of, for example, global positioning systems (GPS), emergency 911 (E911) location, or others, including those that may become available in the future. Currently, various manufacturers produce wireless telephones, which are enabled with the Wireless Application Protocol to present information to the user. Manufacturers include AT&T, SPRINT PCS, GTE WIRELESS. In a specific embodiment, such telephones are appropriate for use as wireless device 202. Furthermore, PHONE.COM makes a product called SDK, appropriate for testing and modeling. This type of products are also intended for use with this invention. One skilled in the art will appreciate that the present invention is not limited to any particular positioning technology. In one embodiment, wireless device 202 is manufactured with built-in positioning capabilities. Presently available providers of positioning information include ERICSSON, QUALCOMM, MOTOROLA, LUCENT, and US WIRELESS.

Detailed Description Text (8):
As shown in FIG. 1, wireless carrier 204 is connected to gateway 206 which provides an interface to network 208. In general, gateway 206 is a network point that acts as an entrance to another network and is provided by, among others, wireless carriers, ISPs, or other telecommunications providers. In an embodiment of the invention, network 208 is the Internet. The Internet provides advantages because it is a widely distributed network reaching many areas of the world. In another embodiment, network 208 is implemented as a proprietary communications network. For example, by utilizing specialized communications network connections, network 208 may be customized to provide minimal latency and optimal performance.

Detailed Description Text (10):
An alternative embodiment for the system architecture of the present invention is shown in FIG. 2A. As illustrated in the figure, wireless device 202, wireless carrier 204 and distributed navigation servers 212 are substantially the same as described for FIG. 1. Direct links 210, however, provide an alternative embodiment to the function of gateway 206 and network 208 of FIG. 1. The direct link architecture is applicable where Internet infrastructure is not well established or fast response is desired for user navigation or other location specific information services. Illustratively, T1, Frame Relay, etc. linked by a LAN or WAN are appropriate for direct links 210. In another embodiment, direct links 210 are implemented as dedicated lines. Alternatively, direct links 210 are implemented as

hard wired connections between wireless carrier 204 and distributed navigation servers 212 where wireless carrier 204 and distributed navigation servers 212 are collocated in a central office.

Detailed Description Text (12):
In accordance with one embodiment of the invention, the Wireless Markup Language (WML) in the Wireless Application Protocol (WAP) is used by the system and method. WML in the WAP is the analogue to HyperText Markup Language (HTML) in Internet Protocol (IP). WML is defined in "WAP WML" as maintained by the WAP Forum and accessible at www.wapforum.org. Such document is herein incorporated by reference for all purposes. WML is a tag-based display language providing navigational support, data input, hyperlinks, text and image presentation, and forms. User interfaces (UI) of WAP applications are constructed using a model of a Deck consisting of one or more Cards. Among other things, WML includes elements for a user to provide input and further provides for navigation and task invocation control. Furthermore, WML includes methods of implementing access control for decks of cards.

Detailed Description Text (53):
As shown in FIG. 1, wireless device 202 communicates through a wireless carrier 204, gateway 206 and the Internet 208 with server 212. In one embodiment, one or more of these connections need not be sustained continuously. ~~FIG.~~ 9 depicts a method for reducing the time when a connection between the wireless carrier and the server is sustained through the Internet. Among other reasons, this approach proves beneficial in reducing the connection time through the Internet. Such a method also proves beneficial when there exists a lag or latency in the Internet connection, or where the Internet connection has a high associated cost measured in money, time or other cost factor.

Detailed Description Text (54):
In particular, as described previously, a user establishes a connection with server 212 as normal at step 902. An authorized user can then proceed to request navigation information using, for example, a voice mode of operation at step 904. The user can further proceed to reroute the requested directions to an alternative repository at step 906. In one embodiment, this alternative repository can take the form of a user's wireless voice mailbox or other suitable device capable of storing information. In one embodiment, wireless device 202 is equipped with appropriate memory to be able to record the requested navigational information locally. At step 908, server 212 responsively reroutes the requested information, as instructed by the user. Having rerouted the information, the Internet connection is discontinued, as shown at step 910. The user can then proceed to retrieve the navigational information via the alternative repository, as shown at step 912.

Detailed Description Text (71):
A method for bookmarking a user's current location is shown at FIG. 12. At step 1202, a user desiring to label his current location selects a "Bookmark Current Location" or similar other option. Upon selecting such an option, the server then requests the user's location at step 1204. In one embodiment, such a request is routed through a location gateway that provides, among other services, geo-location for a user equipped with a GPS or similarly enabled enabled wireless device 202. The appropriately equipped wireless device 202 generates a location signal at step 1206, which is then received and geo-coded at step 1208. At step 1210, the user is then requested to label his current location. The user can provide appropriate input through a keypad on wireless device 202 or, where appropriately configured, through a voice mode of operation. At step 1212, the label and location are then saved in a database. Subsequently, the labeled location is retrieved and used in manners disclosed here as well as in manners known or obvious to those skilled in the art. Furthermore, one of skill in the art understands that variations of the method shown in FIG. 12 are obvious without deviating from the invention.

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Rennard et al.

(10) **Patent No.: US 6,405,123 B1**
(45) **Date of Patent: Jun. 11, 2002**

(54) **METHOD AND SYSTEM FOR AN EFFICIENT OPERATING ENVIRONMENT IN A REAL-TIME NAVIGATION SYSTEM**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/574,555**

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Related U.S. Application Data

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(51) **Int. Cl.**[7] **G01C 21/00**

(52) **U.S. Cl.** **701/200**; 701/201; 701/211; 340/988; 342/357.08; 342/357.1; 342/357.13

(58) **Field of Search** 701/200, 208, 701/201, 211, 213, 24, 28; 370/988–995; 342/357.01, 357.06, 357.08, 357.1, 357.13

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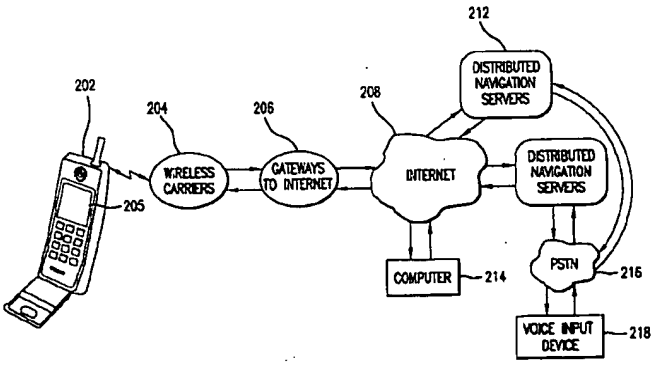
(57) **ABSTRACT**

A method and system for interactive real-time distributed navigation employs improved techniques for input and output. The method and system may receive inputs through a wireless device. The operating environment simplifies and reduces these inputs. In some embodiments, the system receives non-deterministic input to generate deterministic information using a number of methods. The system may also employ improved output techniques including methods for pacing navigational prompts provided by a navigation system, and methods of providing navigational information to a number of users. The method and system are applicable to text, graphics or audible navigation systems.

33 Claims, 18 Drawing Sheets



INTERACTIVE REAL TIME DISTRIBUTED NAVIGATION SYSTEM-ARCHITECTURE A